REMARKS

In the Office Action mailed March, 17, 2009, the Examiner (1) rejected claims 24, 34, 35, 37, 43, and 45 under 35 U.S.C. § 103(a) as being unpatentable over O'Dowd (PCT/IB00/01476) and (2) rejected claims 25-33, 36, 38-42, and 44 under 35 U.S.C. § 103(a) as being unpatentable over O'Dowd in view of Liou (U.S. Patent No. 4,835,779).

1.   Status of the Claims

Currently pending are claims 24-45, of which claims 24, 35, 37, 43, 44, and 45 are independent, and the remainder are dependent.

2.   Response to 35 U.S.C. § 103(a) Rejections over O'Dowd

As noted above, the Examiner rejected claims 24, 34, 35, 37, 43, and 45 under 35 U.S.C. § 103(a) as being unpatentable over O'Dowd. Applicant respectfully submits that O'Dowd does not teach or suggest any of these claims and therefore, that these claims are non-obvious and allowable over O'Dowd.

A.   Claims 24, 34 and 37

At the least, O'Dowd does not teach or suggest repeating steps (a)-(d) of claim 24 until a sufficient range of the second control current/voltage has been used; and identifying, in the resultant data set, regions of *hysteresis.*

In particular, Claim 24 discloses a method of obtaining a measurement plane from a multi-section tunable laser diode. The method comprises (a) obtaining a first set of measurement values for an output of the laser diode by increasing a first current/voltage through a range of values in a positive direction; (b) increasing a second control current/voltage by a step; (c) obtaining a second set of measurement values for the output of the laser diode by decreasing the first control current/voltage through a range of values in a negative direction; (d) increasing a second control

current/voltage by a step; (e) repeating steps (a) - (d) until a sufficient range of the second control current/voltage has been used; and (f) identifying, in a resultant data set, regions of hysteresis.

In rejecting claim 24, the Examiner admitted that "O'Dowd does not disclose: obtaining a second set of measurement values for the output of the laser diode by decreasing the first control current/voltage through a range of values in a negative direction." Office Action, p. 3. However, the Examiner then argued that it "would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the laser device of O'Dowd by sweeping the back current through a range of negative values (varying the back current) in order to find regions of hysteresis." *Id.* Applicant respectfully submits that this is incorrect.

O'Dowd describes the design of an SG-DBR laser and calibration method of such a device. O'Dowd at p. 11, lines 3-18. The calibration is limited solely to mapping the mode structure of the laser and picking operating points within the modes. O'Dowd at p. 20, line 3 – p. 21, line 25. Operating points are chosen by choosing the mid-point between mode boundaries. *Id.* These mode boundaries are found by extrapolation and do not address hysteresis in any way.

More specifically, as plainly shown in Figure 15 of O'Dowd, the five lines of measurement are made at distinctly separate locations in a mode plane. In order to measure hysteresis, ramping current in opposite directions would need to be done within the same mode (i.e. along the same trajectory). This is clearly not the case in Figure 15 of O'Dowd. Therefore, the measurement as described by Figure 15, page 20, lines 23-31 does not yield any information on hysteresis. Nor does O'Dowd suggest such steps to identify regions of hysteresis, or any other information relating to hysteresis.

In summary, O'Dowd describes a method of calibrating a laser, in which currents in the laser are ramped. The way in which the currents are ramped is in no way useful in measuring hysteresis.

Indeed, the application makes no attempt to address hysteresis. Accordingly, as claim 24 recites repeating steps (a)-(d) and identifying regions of hysteresis in the resultant data set, O'Dowd does not render claim 24 obvious.

Furthermore, Applicant submits that the Examiner has failed to establish a *prima facie* case of obviousness because the Examiner fails to provide any explanation or support for the argument that it would have been obvious to modify O'Dowd by sweeping the back current through a range of negative values (varying the back current) in order to find regions of hysteresis. In rejecting claims under § 103(a), the Examiner bears the initial burden of establishing a prima facie case of obviousness. *In re Oetiker*, 977 F.2d 1443, 1445 (Fed. Cir. 1992). *See also In re Piasecki*, 745 F.2d 1468, 1472 (Fed. Cir. 1984). It is incumbent upon the Examiner to establish a factual basis to support the legal conclusion of obviousness. *See In re Fine*, 837 F.2d, 1071, 1073 (Fed. Cir. 1988). Additionally, in making a rejection under 35 U.S.C. § 103(a) on the basis of obviousness, the Examiner <u>must provide some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness</u>. *KSR Int'l. Co. v. Teleflex Inc.*, 127 S.Ct. 1727, 1741 (2007). In the Office Action, the Examiner simply concludes that it would have been obvious to modify O'Dowd to include the admittedly missing elements, without providing any explanation as to why this modification would be obvious. Accordingly, Applicant respectfully submits that the Examiner has not established a *prima facie* case of obviousness.

Further, for at least the same reasons for claim 24, Applicant submits that independent claim 37 is non-obvious and allowable over O'Dowd. Claim 37 recites a control system that comprises a means for identifying, in a resultant data set, regions of hysteresis. Therefore, for at least the reasons presented above for claim 24, claims 37 is non-obvious and allowable over O'Dowd.

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For at least the foregoing reasons, Applicant submits that independent claims 24 and 37 are non-obvious and allowable over O'Dowd. In addition, claim 34 depends from claim 24. Therefore, Applicant submits that claim 34 is allowable over O'Dowd for at least the reason that this claim ultimately depends from an allowable base claim. Accordingly, Applicant respectfully requests that the Examiner withdraw the 35 U.S.C. § 103(a) rejections of claims 24, 34, and 37.

B.   Claims 35, 43 and 45

Claim 35 describes measuring hysteresis along a diagonal by ramping first and second currents at the same time, repeatedly in a zig-zag fashion across a mode plane. In particular, claim 35 discloses a method of obtaining a measurement plane from a multi-section tunable laser. The method comprises: (a) obtaining a first set of measurement values for the output of the laser diode by increasing a first control current through a range of values in a positive direction and decreasing a second control current in a negative direction at the same time; (b) increasing one of the first or second control currents by a step; (c) obtaining a second set of measurement values for the output of the laser diode by increasing the second control current through a range of values in a positive direction and decreasing a first control current in a negative direction at the same time; and (d) repeating steps (a) - (c) until a sufficient range of the first and the second control current has been used, wherein total control currents to the laser are changing at a continuous rate.

In rejecting claim 35, the Examiner cites the same section of the O'Dowd as for claim 24 (Figure 15, page 20, lines 23-31, as well as page 6, lines 6-13). However, as mentioned above in respect of claim 24, in Figure 15 of O'Dowd, the five lines that are measured, measure mode boundaries in distinctly separate locations of a mode plane. While one of the five lines is measured along the diagonal, there is clearly no reference to at least (1) repeating this measurement across the whole plane and (2) measuring along the diagonal alternately in opposing directions; steps that

are performed in order to obtain a data set from which hysteresis can be obtained (i.e., by repeating steps (a) - (c) until a sufficient range of the first and the second control current has been used, wherein total control currents to the laser are changing at a continuous rate). Accordingly, claim 35 is non-obvious and allowable for at least similar reasons as claim 24.

Further, for at least the same reasons as for claim 35, Applicant submits that independent claims 43 and 45 are non-obvious and allowable over O'Dowd. Claim 43 recites a control system that comprises various means that can be operated to perform a method similar to that recited in claim 35. Similarly, claim 45 recites a control system that comprises various components that are configured to perform a method similar to that recited in claim 35. Therefore, for at least the reasons presented above for claim 35, claims 43 and 45 are non-obvious and allowable over O'Dowd.

Accordingly, Applicant respectfully requests that the Examiner withdraw the 35 U.S.C. § 103(a) rejections of claims 35, 43 and 45.

3. Response to the 35 U.S.C. § 103(a) Rejection over O'Dowd and Liou

As noted above, the Examiner rejected claims 25-33, 36, 38-42, and 44 under 35 U.S.C. § 103(a) as being unpatentable over O'Dowd in view of Liou. Applicants respectfully submit that the combination of O'Dowd and Liou does not render claims 25-33, 36, 38-42, and 44 obvious under § 103.

Liou discloses a method and apparatus for producing laser pulses at two wavelengths alternately by switching the oscillations of a distributed feedback semiconductor laser of the continuous grating type back and forth across the stop band. Liou at Abstract. Without specifically addressing the additional features for which Liou is cited, Applicant submits that nothing in Liou teaches or suggests the deficiencies of O'Dowd as discussed above.

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Therefore, Applicant submits that independent claim 44, which recites a computing apparatus for identifying regions of hysteresis in a resultant data set, is non-obvious and allowable over the combination of O'Dowd and Liou. Further, Applicant submits that claims 25-33, 36, and 38-42 are non-obvious and allowable for at least the reason that each of these claims ultimately depends from an allowable base claim. Accordingly, Applicant respectfully requests that the Examiner withdraw the 35 U.S.C. § 103(a) rejections of claims 25-33, 36, 38-42, and 44.

4. Conclusion

For the foregoing reasons, Applicants submit that all of the pending claims are now in condition for allowance, and thus Applicants respectfully request notice to that effect. Should the Examiner wish to discuss any aspect of this application, the Examiner is welcome to call the undersigned at (312) 913-3341.

Respectfully submitted,

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